

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-16. (Cancelled)

17. (Currently Amended) A window washing system for a motor vehicle, comprising:

a nozzle means located adjacent a vehicle window for directing washer fluid against the window;

a chamber for containing washer fluid reservoir to contain a supply of washer fluid, the system having only a single washer fluid flow path extending between the washer fluid reservoir and said nozzle;

a heat exchanger having an inlet connected to said chamber the washer fluid reservoir and an outlet connected to said nozzle means, the heat exchanger having a coolant passage plate and a first wiper fluid plate, wherein the first wiper fluid plate and coolant passage plate are held together by a fastening means and wherein the coolant passage plate allows the passage of coolant from the heat exchanger inlet to the heat exchanger outlet;

pumping means for transferring washer fluid along said single washer fluid flow path by moving the washer fluid from said chamber washer fluid reservoir into said heat exchanger and from said heat exchanger to said nozzle means; and

means for circulating coolant from a motor cooling system into the heat exchanger with the washer fluid inside to thereby heat the washer fluid.

18. (Currently Amended) The system of claim 17, wherein the first wiper fluid plate contains a wiper fluid passage to route wiper fluid through the first plate to transfer heat from the engine coolant, the wiper fluid passage being in the form of a trench recessed in and defined by the first plate, wherein such a trench is only formed on one side of the first plate.

19. (Original) The system of claim 18, wherein a second wiper fluid plate is held to the coolant passage plate by a fastening means.

20. (Original) The system of claim 19, wherein the coolant passage plate further comprises a wiper fluid passage for wiper fluid to pass from the first wiper plate to the second wiper plate.

21. (Original) The system of claim 20, wherein the coolant passage plate has a plurality of wiper fluid plates held to it by a fastening means.

22. (Original) The system of claim 21, wherein each wiper fluid plate has a cover plate to enclose the wiper fluid passages.

23. (Currently Amended) The system of claim 18, wherein the wiper fluid passage is a spiral [[10]] passage trench.

24. (Original) The system of claim 18, wherein the wiper fluid passage contains imperfections to create fluid turbulence.

25. (Currently Amended) A window washing system for a motor vehicle having an engine and an engine coolant system, comprising:

a nozzle means located adjacent a vehicle window for directing washer fluid against the window;

a chamber for containing washer fluid reservoir to contain a supply of washer fluid, the system having only a single washer fluid flow path extending between the washer fluid reservoir and said nozzle; wherein the window washing system includes a washer fluid heater system configured to be installed in the motor vehicle's engine coolant system, the washer fluid heater system being configured to heat washer fluid delivered to said window of the motor vehicle without drawing off battery power from the motor vehicle or otherwise using electricity;

a heat exchanger having an inlet connected to ~~said chamber~~ the washer fluid reservoir and an outlet connected to said nozzle means, the heat exchanger having a ~~coolant passage plate and a first wiper fluid plate~~, wherein the heat exchanger further comprises a coolant plate wherein an upper surface of the coolant plate has a coolant passageway for the motor coolant and a lower surface has a wiper fluid passageway for the wiper fluid;

pumping means for transferring washer fluid along said single washer fluid flow path by moving the washer fluid from ~~said chamber~~ washer fluid reservoir into said heat exchanger and from said heat exchanger to said nozzle means; and

means for circulating coolant from ~~a motor~~ the engine cooling system into the heat exchanger with the washer fluid inside to thereby heat the fluid.

26. (Currently Amended) The system of claim 25, wherein the coolant passageway is a spiral passage trench.

27. (Currently Amended) The system of claim 26, wherein the wiper fluid passageway is a spiral passage trench.

28. (Currently Amended) The system of claim 27, wherein the motor coolant and the wiper fluid flow in different directions within their respective passageways trenches.

29-34. (Cancelled)

35. (Currently Amended) A wiper fluid heater apparatus washer fluid heater system configured to be installed in a motor vehicle having an engine and an engine coolant system, the washer fluid heater system being configured to heat washer fluid delivered to a windshield of the motor vehicle without drawing off battery power from the motor vehicle or otherwise using electricity, the washer fluid heating system comprising:

a heat exchanger configured to be installed into the engine coolant system of the motor vehicle, the heat exchanger having a wiper fluid inlet to allow wiper fluid to enter the heat exchanger and a wiper fluid outlet to allow the wiper fluid to exit the heat exchanger, wherein a

thermally-actuated bypass system is incorporated into the heat exchanger, the heat exchanger having a bypass passage;

a coolant passage traversing through the heat exchanger having a coolant inlet and a coolant outlet, the coolant inlet and coolant outlet operably coupled to ~~an engine's~~ the engine coolant system to allow passage of engine coolant through the heat exchanger; and

the heat exchanger's thermally-actuated bypass system including a thermal actuator positioned within the heat exchanger, the thermal actuator which actuates a gate routing the engine coolant flow to the bypass passage from the coolant passage when the wiper fluid becomes too hot;

wherein the heat exchanger has a first chamber and a second chamber; and

wherein the coolant inlet is operably coupled to the first chamber and the coolant outlet is operably coupled to the second chamber.

36. (Original) The apparatus of claim 35, wherein the wiper fluid flows into the first chamber and then flows into the second chamber.

37. (Original) The apparatus of claim 35, wherein the first chamber pre-heats the wiper fluid and the second chamber heats the wiper fluid to a useable level.

38. (Original) The apparatus of claim 37, wherein the coolant passages traverses through the first and second chamber.

39. (Currently Amended) The apparatus of claim [[34]] 35, wherein the heat exchanger further comprises a third chamber.

40. (Original) The apparatus of claim 39, wherein the coolant passage traverses through the first chamber.

41. (Original) The apparatus of claim 40, wherein the wiper fluid inlet is operably coupled to the second chamber where the wiper fluid is pre-heated by the first chamber.

42. (Original) The apparatus of claim 41, wherein the wiper fluid outlet is operably coupled to the third chamber where the wiper fluid remains heated by the first chamber.

43. (Original) The apparatus of claim 42, wherein the first chamber is smaller than the second chamber.

44. (Cancelled)

45. (Currently Amended) A wiper fluid heater apparatus, washer fluid heater system configured to be installed in a motor vehicle having an engine and an engine coolant system, the washer fluid heater system being configured to heat washer fluid delivered to a windshield of the motor vehicle without drawing off battery power from the motor vehicle or otherwise using electricity, the washer fluid heating system comprising:

a heat exchanger configured to be installed into the engine coolant system of the motor vehicle, the heat exchanger having a wiper fluid inlet to allow wiper fluid to enter the heat exchanger and a wiper fluid outlet to allow the wiper fluid to exit the heat exchanger, wherein a thermally-actuated bypass system is incorporated into the heat exchanger, the heat exchanger having a bypass passage;

a coolant passage traversing through the heat exchanger having a coolant inlet and a coolant outlet, the coolant inlet and coolant outlet operably coupled to an engine's the engine coolant system to allow passage of engine coolant through the heat exchanger; and

the heat exchanger's thermally-actuated bypass system including a thermal actuator positioned within the heat exchanger, the thermal actuator which actuates a gate routing the engine coolant flow to the bypass passage from the coolant passage when the wiper fluid becomes too hot;

wherein the heat exchanger has a first chamber and a second chamber;

wherein the coolant passage traverses through is only directly adjacent to the first second chamber; and

wherein the wiper fluid inlet is operably coupled to the ~~second~~ first chamber where the wiper fluid is pre-heated by the first chamber.

46. (Currently Amended) The apparatus of claim 45, wherein the wiper fluid outlet is operably coupled to the ~~first~~ second chamber.

47. (Currently Amended) The apparatus of claim 46 ~~45~~, further comprising a pressure valve coupled to the wiper fluid outlet.

48. (Currently Amended) The apparatus of claim 47, further comprising a return ~~wiper fluid outlet operably coupled to the second chamber, the return wiper fluid outlet operably coupled to the pressure valve line that enables heated vapor to enter the first chamber.~~

49. (New) A window washing system for a motor vehicle, comprising:  
a nozzle located adjacent a vehicle window for directing washer fluid against the window;

a washer fluid reservoir to contain a supply of washer fluid, the system having only a single washer fluid flow path extending between the washer fluid reservoir and said nozzle; wherein the window washing system includes a washer fluid heater system configured to be installed in the motor vehicle's engine coolant system, the washer fluid heater system being configured to heat washer fluid delivered to said window of the motor vehicle without drawing off battery power from the motor vehicle or otherwise using electricity;

a heat exchanger having an inlet connected to the washer fluid reservoir and an outlet connected to said nozzle;

pumping means for transferring washer fluid along said single washer fluid flow path by moving the washer fluid from said washer fluid reservoir into said heat exchanger and from said heat exchanger to said nozzle; and

means for circulating coolant from a motor cooling system into the heat exchanger with the washer fluid inside to thereby heat the washer fluid.